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Assortative mating by occupational status during early industrialization

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Abstract

According to the logic of industrialism thesis during industrialization, the influence of, achieved characteristics on mate selection increased, while the influence of ascribed, characteristics decreased. Other processes that accompanied industrialization, such as, the development of mass communication, urbanization, increasing regional mobility, modern transport, and educational expansion, were hypothesized to break down, cultural differences and cause a decline of status based mate selection. This study, provides a first direct test of these hypotheses by analyzing a large dataset on, marriages in the Dutch province Zeeland between 1811 and 1915, a period before and, during industrialization. Industrialization and the other afore mentioned processes, were measured at the local level in each year of marriage, to take both local and, temporal variation into account. Using multilevel analyses it is shown that (1) the, influence of ascribed and achieved characteristics on status of the spouse differed, considerably between municipalities and changed over time, (2) the influence of, ascribed characteristics decreased, while the influence of achieved characteristics, remained unchanged, (3) the logic of industrialism thesis is supported, while, processes accompanying industrialization are less systematically related to changes in, ascription and achievement.

Keywords: Homogamy; Industrialization; Status attainment; Context

1. Introduction

Over the past few decades, numerous researchers have studied the question of who marries whom (Kalmijn, 1998). This topic is of interest to social scientists and important to society because it enhances our understanding of the stratification of society. When high marries high and low marries low, there are strong barriers between status groups, and society can be considered socially closed. This is even more the case when characteristics determining partner choice are mainly ascribed and not achieved. In this case, the position in society of the future spouse can already be predicted at birth. Research shows that in recent marriage cohorts achieved characteristics (education for example) are more important predictors of marital choices than ascribed characteristics (father's occupational status for example) (Blau & Duncan, 1967; Kalmijn, 1991, 1994; Mare, 1991; Uunk, 1996). However, drawing on the industrialism thesis (Kerr, Dunlop, Harbison, & Myers, 1960; Treiman, 1970) one can conclude that in the past partner choices were predominantly affected by ascribed characteristics. Only when industrialization took place did societies become more open, barriers between sta-

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tus groups become weaker, and achieved characteristics become more important.

This study investigates the validity of the claims that openness has increased by studying whether, and if so how, macro developments during early industrialization changed the process of partner selection in the Dutch province of Zeeland between 1811 and 1915. Focusing on the bridegroom, this chapter addresses the following questions: (1) To what extent did the occupational status of his father (ascribed characteristic) and his own occupational status (achieved characteristic) increase his likelihood of marrying a woman from a high-status group? (2) Did the influence of ascribed and achieved characteristics on partner selection differ between regions and periods? (3) To what extent can such differences be explained by macro processes such as industrialization, mass communication, and urbanization?

Theories concerning the effects of industrialization on status attainment were originally formulated in relation to attainment in the labor market, but they have since been extended to partner selection (Blau & Duncan, 1967; Uunk, 1996). With industrialization, labor markets and societal life changed. Industrialization can be defined as "the use of mechanical contrivances and inanimate energy (fossil fuels and water power) to replace or augment human power in the extraction, processing, and distribution of natural resources or products derived therefrom" (Davis, 1955, p. 255). It created many new occupations and changed the content of existing occupations. In industrial labor markets it became more rational for employers to select employees on the basis of achieved characteristics, such as the level of education, than on the basis of ascribed characteristics. Accordingly, achieved characteristics became more important predictors of an individual's success on the labor market than ascribed characteristics. This has consequences for mate selection. One of the characteristics that potential mates value in each other is (future) economic success (Kalmijn, 1998, p. 502). In industrialized societies, ascribed characteristics should therefore be less important for mate selection and achieved characteristics more important, compared with preindustrialized societies (Blau & Duncan, 1967; Uunk, 1996).

Historical and sociological studies do not yet provide a definite answer to the question whether industrialization and its accompanying macro processes changed the importance of ascribed and achieved characteristics for the selection of a spouse. Historical studies addressing partner choice in the nineteenth and early twentieth centuries have often focused on partner characteristics other than occupational status, such as the age of the spouses or the geographical distance between the spouses (Kalmijn, 1991; Lynch, 1986; Oris, 2000; Van Poppel and Nelissen, 1999; Van Poppel & Ekamper, 2005). Historical studies that do address the role of status attainment in partner selection tend to focus on a specific social group, a small region, or study a few points in time, making it difficult to generalize the research findings (Kocka, 1984; Lanzinger, 2005; Mitch, 1993; Schüren, 1993). Recent historical studies of marriage patterns, using log-linear analyses, do cover larger regions and longer periods, but they distinguish only a few periods and do not explicitly relate marriage choice to macro developments (Van Leeuwen & Maas, 2005). Sociological studies of homogamy more often study longer periods, larger regions, more variables, and a sample of the total population. However, their analyses seldom predate World War II, by which time the process of industrialization had been more or less completed in all Western countries (Smits, Ultee, & Lammers, 1998; Ultee & Luijkx, 1990).

The present study will improve on previous research in four ways. First, it investigates processes of partner selection in a Western country over a very long period, starting before the onset of industrialization and finishing when industrialization and its accompanying macro processes were advanced. In this way, the industrialism thesis can be tested on its home ground, i.e. during industrialization. Second, it distinguishes between local contexts within the province of Zeeland. This allows us to take into account the fact that macro-level developments such as industrialization did not occur throughout society at the same time. Some regions remained mainly agricultural long after industrialization had begun in other regions. Consequently, mate selection is expected to differ regionally, an expectation that has already found some support in research on occupational status attainment (Grusky, 1983; Zijdeman, 2008, 2009). Third, this study improves on previous research by relating several macro-level developments to the process of mate selection. Previous research has often been limited in the number of indicators it has used to characterize macro developments, while sometimes only time is used to indicate the development of industrialization and other macro processes. The macro-level developments that occurred in the nineteenth and early twentieth centuries have a more structural side, i.e. changes in the labor market that favor selection based on achieved characteristics, and a more cultural side, i.e. changes in human relations and values due to urbanization, educational expansion, mass communication, and mass transport (Craig, 1981; Garnier & Hage, 1991; Rijken, 1999; Treiman, 1970). Both aspects will be operationalized

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and we will test which of the macro-level developments were more important in explaining processes of marital choice. We will refrain from using the term modernization when we refer to these macro-level developments. Theoretically, it is unclear what processes are considered to be part of modernization, and on what grounds. This makes it difficult to specify the mechanism behind modernization and to empirically test how modernization influences the processes of homogamy (Netll & Robertson, 1966). Moreover, the term "modernization" often leads to a characterization of regions as either modern or traditional (Eisenstadt, 1974). Even studies that solve this issue by scaling the degree of modernization (Smits, Ultee, & Lammers, 2000) do not take into account differences in how advanced the separate modernization processes were. As a fourth improvement on previous research, this study utilizes a large dataset, including all marriages that took place among the total population of a large region encompassing over 100 municipalities over the course of more than a century. This will circumvent the selection problems encountered by previous studies and enable us to study macro-level changes and differences with sufficient power.

In the next section general notions about partner choice will be combined with the industrialism thesis to derive hypotheses on the changing effects of ascribed and achieved characteristics on partner choice. The hypotheses will be tested using data from all civil marriage records for the Dutch province of Zeeland in the period 1811–1915, supplemented by annual data on developments at the level of municipality, such as industrialization and urbanization. Using multilevel analyses this study will show whether the effects of one's own and one's father's occupational status on the likelihood of marrying a high-status bride differed between regions and periods. In a second step, we will explain these differences using data on macro-level developments.

2. Theories and hypotheses

Researchers interested in the effect of achieved and ascribed characteristics on marital choices in contemporary Western societies model marital choices in a symmetric way, taking into account both the characteristics of the bridegroom and those of the bride (Hendrickx, 1994; Kalmijn, 1991; Uunk, 1996). In the nineteenth and early twentieth centuries though the mate selection process was less symmetric. This was caused by the high likelihood of women ending their occupational career at marriage and their low likelihood of attaining a high-status occupation. As a consequence, their occupation at marriage was not a good predictor of the future economic success of the couple. The status of the father of the bride was a more important predictor of the couple's economic success. High-status fathers could help the young couple with money, finding a house, and promoting the career of the son-in-law. We therefore model the mate selection process in the preindustrial and industrializing period as an asymmetrical process, omitting the status of the bride (Fig. 1) not because she did not play an active role in searching for a spouse, but because she often had no occupational status and, even if she had, it would hardly have affected the future economic success of the couple.

Ascribed and achieved characteristics of bride and groom are easy to distinguish in theory, but more difficult in this model. Whereas the association between the status of the father of the bridegroom and that of the father of the bride clearly reflects ascription, the association between the status of the groom and that of his father-in-law is a combination of ascription and achievement. This

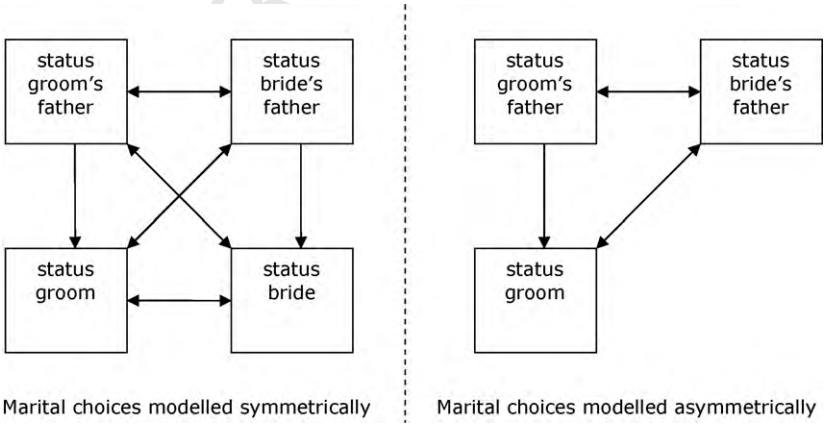

Fig. 1. Symmetric and asymmetric models of marital choice. Note: Single-headed arrows indicate causal relationships, double headed arrows indicate selection processes.

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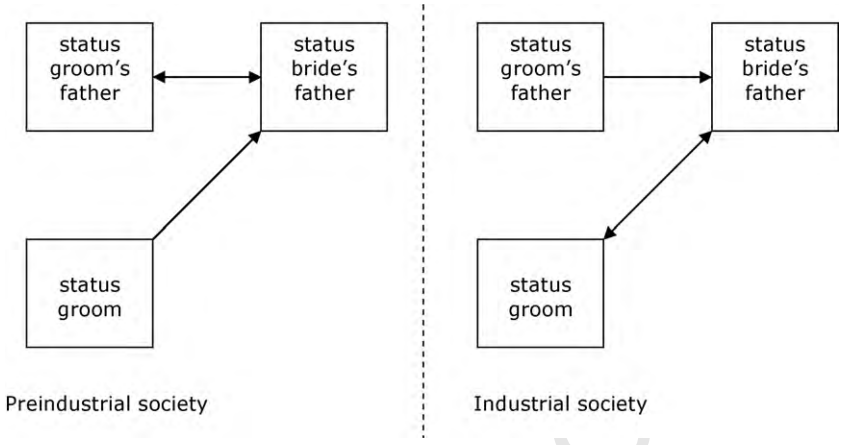

Fig. 2. Economic selection criteria with regard to marital choice in preindustrial and industrial societies. Note: Single-headed arrows indicate causal relationships, double headed arrows indicate selection processes.

association combines the effect of the achieved status of the groom with that of the ascribed status of the bride. In both cases, of course, these effects describe selection processes and not causal effects (Fig. 2).

2.1. Preferences, third parties, and the marriage market

The hypotheses on changes in the process of marital selection will be derived both from general notions on marital choice and from the industrialism thesis. Based on the sociological literature, Kalmijn (1998) distinguishes three elements that determine the selection of a marriage partner: (1) people's preferences concerning the socioeconomic and cultural resources of the marriage partner, (2) the influence of third parties, and (3) the structure of the marriage market.

People's preferences for resources owned by potential partners are important because, as in a market for goods or jobs, a high demand for a particular resource increases its value. As a result, potential spouses possessing this popular resource are more desired than those who do not. Given that these popular spouses are also looking for popular resources, "the most attractive candidates select among themselves, while the least attractive candidates have to rely on one another" (Kalmijn, 1998, p. 398). Kalmijn (1998) notes that people do not always prefer more resources to fewer resources. He argues that although people prefer partners with a larger quantity of socioeconomic resources, with regard to cultural resources they prefer partners similar to themselves.

A second element that plays an important part in theories on marital choice is third-party (such as parents, peers, Church) influence. Spouses share not only personal resources, but also resources from their social networks. Therefore, third parties have an interest in ensuring that marriage does not corrode their pool of resources. Although this seems beneficial for the spouse as well, the individual preferences of the spouse and third-party interests might collide. The more marriage candidates depend on a third party (parents) and the more they are integrated into a third party's social network (such as the Church), the higher the probability of their reconciling themselves to that third party's influence.

Selection of the marriage partner also depends on the marriage market. The influence of the marriage market is based on the notion that the more often one meets individuals with a specific characteristic, the higher the probability of selecting a marriage partner with that particular characteristic. The probability of meeting members of a group depends on several group characteristics, such as the size and the geographical positioning of the group (Blau & Schwartz, 1984). Members of groups that are larger and geographically more concentrated are more likely to marry endogamously (Lieberson & Waters, 1988).

The industrialism thesis argues that industrialization and its accompanying macro processes have changed the interplay between individual preferences, third-party preferences, and the marriage market. In the next sections, we will derive hypotheses from this thesis concerning the effects of the status of parents and bridegrooms on marital choices.

2.2. Effects of industrialization on partner selection: the industrialism thesis

According to the general notions on partner choice, people have a preference for a partner with many economic and similar cultural resources. Since marriage is

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aimed at a long-lasting relationship, future marriage partners will have an interest not only in the current resources of the spouse, but also in the spouse's future resources. The quality and quantity of these future resources is uncertain (Oppenheimer, 1988). To decrease this uncertainty, people will look for proxies for future success (Kalmijn, 1991). According to the industrialism thesis, before industrialization the characteristics of the family of origin were especially good proxies for the spouse's future socioeconomic position. Sons would often eventually have similar occupations as their fathers. Some fathers would be able to pass on their own occupation directly to their sons. Others could help their sons in the local job market to attain an occupation with a status similar to that of their own. Often, daughters stopped working on marriage, if they had an occupation at all. Before industrialization, the occupational positions of the fathers of the bride and groom were therefore important indicators of the success of the bride and groom later in life.

The rise of industrialism changed the main indicator for the future socioeconomic position of the bridegroom. New and more diverse occupations emerged, making it more difficult for fathers to pass on the required occupational skills to their sons (Treiman, 1970). Instead, schools or firm-specific training programmes would provide the necessary skills, making the education and occupational status of the bridegroom rather than the occupational status of the groom's father the best proxy for future socioeconomic resources.

Industrialization also changed the influence of third parties, especially the parents. Before industrialization, the economic success of the children depended heavily on their parents. As a consequence, parental influence on the lives of their children, including their marital decisions, was considerable. Given the lack of a social security system to provide for them in old age, parents had an interest in promoting the future resources of their children by having them marry a member of a family at least as "good" as their own. Due to the new occupational opportunities created by the industrialization process, children became less economically dependent on their parents (Shorter, 1975). As a result, they were less inclined to concede to parental advice and preferences with respect to their future spouse.

To summarize, according to the industrialism thesis future socioeconomic success was a highly valued resource in a partner both before and after industrialization. Before industrialization, the best proxy for future success is the father's occupational position, and parental preferences mattered a great deal in partner choice. After early industrialization the best proxy for socioeconomic success is the bridegroom's level of education and his achieved occupational status. The focus of a bride and her father therefore shifted from the groom's father to the groom. However, the focus of the groom and his father remained the occupational status of the bride's father (Fig. 3.2), since during early industrialization brides seldom had an occupational status that could be used as an indicator for future economic success. Thus the shift in the focus of the bride and her father decreased the association between the occupational status of both fathers, while increasing the association between the occupational status of the groom and that of the bride's father. We hypothesize:

Hypothesis 1a. The more industrialized a region or period, the weaker the association between the occupational status of the groom's father and that of the bride's father.

Hypothesis 1b. The more industrialized a region or period, the stronger the association between the occupational status of the groom and that of the bride's father.

2.3. *Extensions of the industrialism thesis*

Apart from industrialization, other macro processes such as migration and urbanization are hypothesized to influence the process of mate selection. However, while it is argued that industrialization changed economic preferences especially, it is also argued that the processes accompanying industrialization influenced cultural preferences and opportunities to meet in particular. Due to mass communication, urbanization, geographical mobility, educational expansion, and mass transport, people were increasingly confronted with elements (ideas, habits, individuals) from outside their own group (family, municipality, Church, or class), decreasing their orientation towards their own group and the influence of their own group. This led to a more open society by decreasing the influence of both ascription *and* achievement. More specifically, we test Treiman's hypotheses that (a) more pervasive mass communications, (b) greater urbanization, (c) increased geographical mobility, and (d) educational expansion "break down the rigidity of the class structure of traditional society, and thus [to] increase the ease of mobility" (Treiman, 1970, p. 219). In addition, this chapter provides a new hypothesis on the influence of means of mass transport on homogamy.

As a characteristic of modern societies, mass communication is said to develop a common culture and to decrease regional, ethnic, and class differences in attitudes and behavior (Treiman, 1970). Mass communication is able to "form historically new bases for

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collective thought and action quickly, continuously and pervasively across previous boundaries of time, space and status" (Treiman, 1970, p. 219). We expect that due to mass communication the preference of a groom for marrying a bride from the same status group will decline. Not because his preference for a culturally similar spouse becomes less, but because the observed cultural differences between members of different status groups become smaller. Parents and other interested third parties, such as peers and neighbors, will also observe fewer cultural differences and therefore object less to marriages with someone with a different status (Gerbner, 1967). Urbanization and increased geographical mobility have the same effects as mass communication, but they are hypothesized to have changed processes of partner selection in other ways too. Treiman (1970) argues that people living in smaller communities are more easily helped (or hindered) by their parents, while people who move to a new area or who live in large cities have to depend on themselves. As a consequence, urban men and women on the marriage market are less affected by third parties in deciding whether to marry a partner with a high social status. Uunk adds that in large municipalities third parties, including parents, are less able to influence whom young people meet than in small municipalities (Uunk, 1996, p. 62). He also claims that urbanization caused an increasing number of people to grow up in more heterogeneous areas with regard to social status and education, creating opportunities for social mixing (Uunk, 1996, p. 62). Taken together, urbanization and geographical mobility seem to have decreased the influence of both ascribed and achieved characteristics on partner choice, although achieved characteristics were probably affected less.

Apart from these existing hypotheses, we derive a new hypothesis on the effects of means of mass transport. As is the case with urbanization and migration, transport increases people's opportunities to escape from third-party influence and to meet people from other social and regional backgrounds. Transport, however, differs from urbanization and migration in that it allows a more gradual experience of what is outside the local community. People using transport for work or leisure experience what is outside their own group, even when living in less urbanized regions or in communities with low migration rates. Also, "outsiders" using transport "invade" local communities and allow the local population to experience different habits (such as clothing, manner of speech), changing their preferences and increasing their opportunities.

A last macro development that is hypothesized to increase people's understanding of other groups and to decrease their orientation towards their own group is the expansion of education. In the second half of the nineteenth century almost all children in the Netherlands attended primary school for at least a few years (Boonstra, 1993, 1995; Knippenberg, 1986). In 1863 a statutory education system was created that provided different types of secondary schooling for general and practical education (Bartels, 1963; Mandemakers, 1996). It is likely that these schools increased their pupils' knowledge of the world outside their own municipality and thereby weakened their in-group preferences. Schools probably also increased opportunities to meet people from other social strata, although not directly people of the opposite sex. Only later, when tertiary education was expanded and opened up to women too, did universities become marriage markets coupling partners with the same achieved status (Blossfeld & Timm, 2003).

In sum, the arguments as to why macro processes accompanying industrialization affect homogamy focus on the cultural preferences of a spouse and/or on marriage markets. With the rise of a mass culture, people from different backgrounds become more alike, weakening the relationship between ascribed characteristics and a culturally similar other. Furthermore, due to increased opportunities to meet, people from different strata have a higher probably of meeting and potentially mating. While industrialization is argued to have actually changed the selection process, the processes accompanying industrialization merely weakened the selection based on status (Fig. 3). We therefore expect that:

Hypothesis 2a. The more mass communication, urbanization, migration, means of transport, and education in a region or period, the weaker the association between the occupational status of the groom's father and that of the bride's father.

Hypothesis 2b. The more mass communication, urbanization, migration, means of transport, and education in a region or period, the weaker the association between the occupational status of the groom and that of the bride's father.

3. Area, data, measurements, and method

3.1. Area

The area under study is the Dutch province of Zeeland, situated in the southwest of the Netherlands and bordering the North Sea to the west and Belgium to the south. In the period being studied it consisted of two strips of land connected to the mainland north of Belgium

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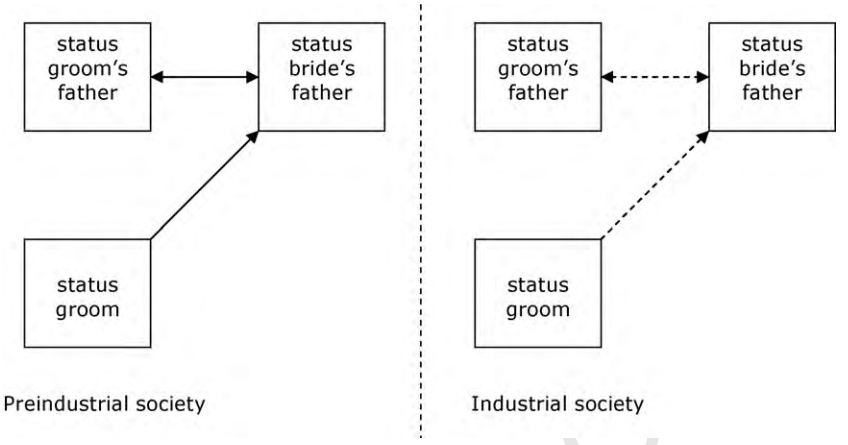

Fig. 3. Cultural selection with regard to marital choice in preindustrial and industrial societies. Note: Single-headed arrows indicate causal relationships, double headed arrows indicate selection processes. Dashed lines indicate weak selection, continuous lines indicate strong selection.

and to the southwest of the Netherlands and of about five inhabited small islands (the precise number changed over time). By reclaiming land from the sea through dykes and water management, several islets were merged and between 1817 and 1910 the area of land under cultivation in Zeeland increased from 311,833 to 366,259 acres (Priester, 1998, p. 446).

As a province, Zeeland can be characterized as largely agricultural. In the first half of the nineteenth century the main crop grown was wheat (Priester, 1998). Wheat being rather exhaustive for the clay soil, farmers chose from time to time either not to use their land or to grow other crops that were less exhaustive, such as rape-seed, common flax, rose madder, and sugar beet (Knippenberg, 1972; Knippenberg & De Pater, 2002; Landbouw, 1871, 1872). These other crops were grown mainly for trade, but by the end of the nineteenth century sugar beet and to a lesser extent common flax were grown on an increasingly large scale for the production of sugar and textiles, respectively, in factories in Zeeland (Franken, 2004; Priester, 1998). Given the large size of the agricultural sector and thus the large amount of manual labor required, it is remarkable how slowly the sector was mechanized and how slowly manual labor was replaced. Priester (1998) explains this by the special technique used in Zeeland to grow wheat, which involved thorough manual weeding. The extremely labor-intensive weeding resulted in clean sheaves for which there was a large demand throughout the country. However, the weeding required the wheat to be sown over a wide area, whereas the sowing machinery introduced from abroad sowed seeds in a concentrated fashion and row-wise. Also, thrashing machinery would damage too much of the scarce high-quality wheat and was therefore not used. Furthermore, the imported machinery designed for the large farms in Britain and the United States was simply too large for Zeeland's farms or too heavy for the moist clay soil. Another problem was that the cost of purchasing machinery was too high to be beneficial for a single farmer. The cost of a steam plough was roughly four times the annual wage of an agricultural laborer (Van Zanden, 1992, p. 65).

Despite these difficulties, initiatives to acquire and use machinery in agriculture developed. While some farmers bought machines together and helped each other with sowing and harvesting, others bought a machine and employed personnel for hiring it out (Priester, 1998, p. 241). Also, the increasing demand from and better contracts provided by factories for large-scale production of crops such as sugar beet is likely to have stimulated the purchase of "modern" machinery by the growing number of large-scale farmers (Bakker, 1992; Priester, 1998, p. 245).

There was also increasing mechanization in the more urbanized municipalities in Zeeland, resulting in an expansion of the industrial sector. Alongside the flax and sugar industries mentioned above, various types of other industry were present in Zeeland, including shipbuilding, beer brewing, shoemaking, textiles, concrete production, and wood sawing (Franken, 2004). These factories were to be found not just in the two largest cities in Zeeland, Middelburg and Vlissingen (Flushing), but in various smaller municipalities as well (Franken, 2004).

Later on in the nineteenth century, mechanization extended further to the realm of transport. Between 1868 and 1872 the first four train stations in Zeeland were opened, although in the four decades after that this number did not increase. Zeeland's first steam tram arrived later, in 1882, but it proved a more successful means of mechanized transport. In 1915 there were more than

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25 municipalities that could be reached by tram (Sluiter, 2002).

Apart from its agricultural character and the late development of mechanization, Zeeland was also characterized by regional differentiation with regard to land use, religion, and social differentiation, an observation confirmed by various historical accounts (Bouman, 1946; Bras & Kok, 2005; Priester, 1998).

In sum, characterizing Zeeland as a homogeneous agricultural province does not do justice to the various pockets of industrialization in the province. While some municipalities changed scarcely at all, others tried to adopt the technical developments taking place in agriculture, production, and transport. It is exactly this regional and temporal variation that makes Zeeland suited to testing our hypotheses.

3.2. Data

The hypotheses will be tested using data on marriages and annual data on macro processes such as industrialization and mass communication at the municipal level. The marriage data stem from all marriage records in Zeeland for the period 1811–1915 ($N = 143{,}890$).[1] These records are part of the Civil Records of Zeeland Database located at the Zeeuws Archief in Middelburg (the Netherlands). At the contextual level, information on six macro-level processes is derived from various sources. With regard to industrialization, information on steam engines was derived from the Registers of the Dutch Department for Steam Engineering, which are reports on the safety of steam engines (Lintsen & Nieuwkoop, 1989–1991).[2] The annual reviews on Dutch education, the *Verslagen van den Staat der Hooge-, Middelbare en Lagere Scholen*, for the period 1860–1915 were consulted for information on educational expansion (Scholen 1862–1917). Concerning communication, data on the presence of a post office in a municipality were derived from the *Verslagen aan den Koning betrekkelijk de Dienst der Posterijen en der Telegrafen* in 1879 for the period 1811–1879 and from the annual reviews 1880–1915 for subsequent years (Posterijen 1880–1916). To gain an insight in the availability of means of mass transport, data on the presence of railway and steam tram stations in a municipality were gathered from a study on Dutch tram and railway companies between 1881 and 1981 (Sluiter, 2002). Data on urbanization and migration were retrieved from the Historical Ecological Database (HED) (1851–1880 and 1900–1915), the Historical Database of Dutch Municipalities (1811–1850 and 1880–1900) and the Dutch Census (1851–1915). These sources also provide information on religious denomination at the municipal level.

3.3. Measurements

For a long time, an important issue in historical studies of social stratification was that of determining people's position in society. The use of an occupational title as an indicator of social position, as is common in present-day research, was criticized in historical research for a number of reasons. Occupational titles would provide too little information on a person's socioeconomic position (De Vries, 1986). Also, there would be confusion in occupational terminology "across time and space, within as well as between languages" (Van Leeuwen, Maas, and Miles, 20[illegible] p. 9). Further, extracting occupational titles from individual archive records is rather time consuming, limiting the focus of any research to a small number of municipalities or a short period of time. In the past, studies have dealt with these issues by using creative indicators of an individual's position in society, such as the location of their pew in church (Lucassen & Trienekens, 1978) or the level of taxes they paid (De Vries, 1986). Some historical studies did use occupational titles, but they tended to develop their own occupational scheme, making it difficult to compare studies with one another.

Over the past few decades, however, each of these issues has been tackled. By reporting a high correlation between mean income of occupations and the prestige of these occupations as measured by the prestige scale of Van Heek (1958), Mandemakers (1987) showed that, as in contemporary societies, historical occupational titles provide adequate information on social status. Furthermore, comparability of historical occupational titles between languages and over time has been achieved by the development of the Historical International Standard

[1] We are grateful to L. Hollestelle for providing access to this dataset. The dataset encompasses 163,715 records of marriages in Zeeland in the period 1795–1923. The number of marriages before 1811 and after 1922 is extremely small compared with the data for 1811 and 1922, respectively, and we assume that the recording of marriages was incomplete both prior to 1811 and after 1922. Since most of the contextual data are available for the period up to 1915, we use the marriage records for the period 1811–1915 ($N = 143{,}890$). Due to changes in the names of municipalities, which affected 148 marriage records, no contextual information could be retrieved for those records. We thus use the data drawn from a total of 143,742 marriage records.

[2] The Registers of the Dutch Department for Steam Engineering are available through the Data Archiving and Networked Services at http://www.dans.knaw.nl [last accessed 10 February 2010]. We would like to thank H.W. Lintsen for making his data available for public use. A description of the registers can be found in Lintsen and Nieuwkoop (1989–1991).

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Classification of Occupations (HISCO) (Van Leeuwen, Maas, & Miles, 2004). Based on ISCO-68 HISCO provides a classification of historical occupational titles based on occupational titles derived from 2.4 million personal records drawn from eight countries for the period 1692–1950 (Van Leeuwen et al., 2004). Also, historical research on status attainment is no longer bound to local regions or short periods. Numerous projects digitizing personal records (including marriage records) now provide information on occupational titles over longer periods and covering larger geographical areas. And finally, the development of a universal historical occupational stratification scale HIS-CAM (v.0.1) increases the comparability of studies of historical stratification (Lambert, Zijdeman, Maas, Prandy, & Van Leeuwen, 2006; Zijdeman & Lambert, 2010). For each occupational code in HISCO, HIS-CAM provides a score that represents the position of that occupation in the stratification structure. The theoretical scale scores range from 1 to 99. HIS-CAM is a historical version of the CAMSIS scales and as such assumes that the overall occupational stratification structure is represented by patterns of social interaction between people from different occupational strata (Bottero, 2005; Prandy, 2000; Prandy & Lambert, 2003; Stewart, Prandy, & Blackburn, 1980). This means that the more often people with a certain occupation interact, the closer these occupations will be to one another in the occupational stratification structure. To estimate the patterns of association, Goodman's RCII models are used (Goodman, 1979). The estimates are based on 1.5 million marriage records drawn from six countries (Britain, Canada, France, Germany, the Netherlands, and Sweden) and covering the period 1800–1938.

In order to assign HIS-CAM scores to the occupational titles of the Zeeland grooms, grooms' fathers, and brides' fathers, we first coded the occupations into HISCO. Unfortunately, not all marriage records provided accurate enough information on all three occupational titles. The 143,742 marriages yielded 72,138 (50.2%) coded occupations for brides' fathers, 65,211 (54.4%) for grooms' fathers, and 138,532 (96.4%) for grooms. The number of marriages for which all three status scores are available for the period 1811–1915 is 38,513 (26.8%). The large number of missing data is not surprising (Bras & Kok, 2005; Van de Putte, 2003). For example, in a study of the marriage records of 994 higher education students in 1880 and 1920, 54.8 percent of the occupations of grooms' fathers were omitted (Zijdeman & Mandemakers, 2008). A missing occupation might have meant that the father had no occupation (and no earnings), or that he had earnings from sources other than work, such as property, or, most likely, that the parents were deceased. Delger and Kok (1998) argue that this potentially leads to bias in the data. Since the early death of fathers might be related to poor living and working conditions, and such conditions are generally more common among those with a low occupational status, the associations estimated will be more representative for those of higher than lower status. Furthermore, over time the number of fathers who deceased before their children married decreased. Thus in later periods the estimates are a better representation of the "actual" associations. However, recent studies of the Netherlands in the second half of the nineteenth and first half of the twentieth centuries find no relationship between social position and mortality rates. Van Poppel and Van Gaalen (2008) specifically address the relationship between social position and mortality in their study, and they find no such relationship for Dutch adult men born between 1850 and 1920.

To identify any possible bias due to the attrition of the occupation of grooms' father in our data, Fig. 4 depicts the proportion of missing occupations of grooms' fathers by occupational status of the groom for each decade between 1820 and 1910. The graph shows that the proportion of missing occupational titles of grooms' fathers was remarkably stable over time and hardly altered with the occupational status of the groom. In fact, if there is any tendency to be identified it is that the proportion of missing occupational titles increases rather than decreases with the grooms' occupational status. The large number of missing occupational titles of grooms' fathers is unfortunate, but it does not appear to be related to the occupational status of grooms. This matter is discussed further in section 5.

3.3.1. Dependent variable

The dependent variable in all analyses is the *occupational status of the bride's father*. It is constructed by assigning a HIS-CAM score corresponding to the occupation of the bride's father as registered on the marriage record of his daughter and son-in-law. HIS-CAM scores range from 1 to 100.

3.3.2. Independent variables

The independent variables used in the analyses are indicators at the individual as well as the contextual level. At the individual level the independent variables are:

Status of the groom's father: The occupational status of the groom's father is the HIS-CAM score of his occupation as registered on his son's marriage record. To enhance the interpretability of the results, the status of the groom's father is centered on the grand mean for the

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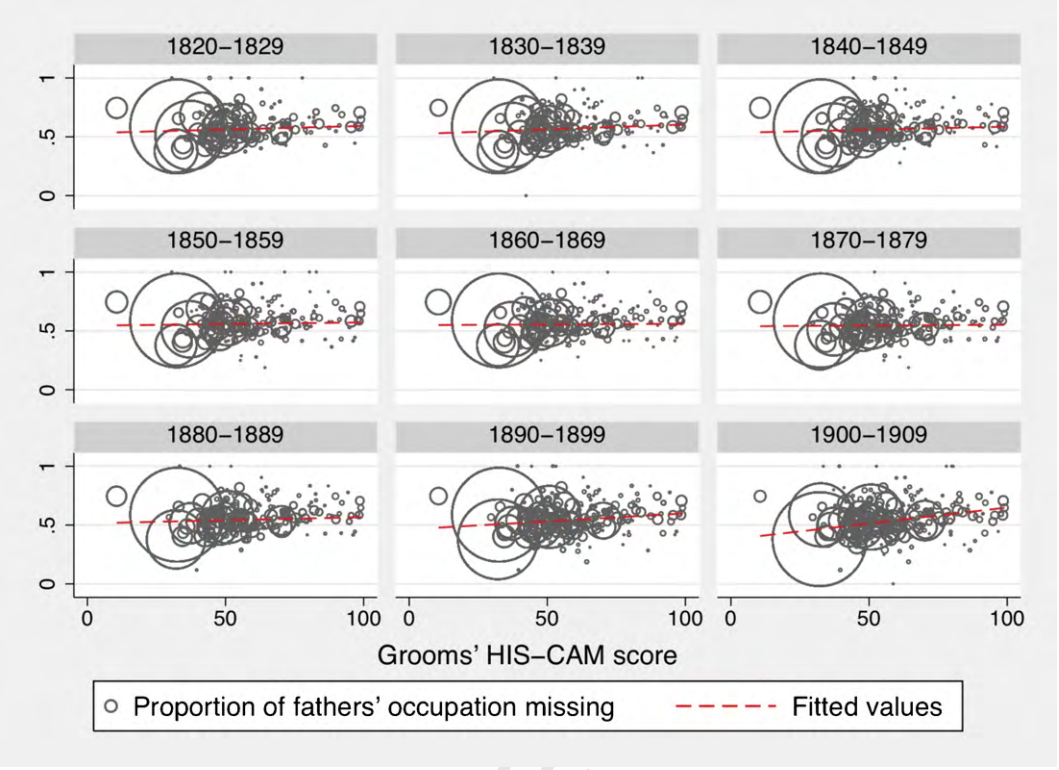

Fig. 4. Proportion of missing occupational titles of grooms' fathers by grooms' occupational status and decade. Note: The size of the circles indicates the number of grooms with a specific occupation.

period 1811–1915, i.e. the value of this variable is set to zero for grooms' fathers who are of average status.

Status of the groom: The occupational status of the groom is created by assigning a HIS-CAM score corresponding to the occupation of the groom as registered on his marriage record. The status of the groom is centered on the grand mean for the period 1811–1915.

The contextual variables refer to the characteristics of the municipality in the year of a groom's marriage. They are:

Industrialization: To operationalize industrialization we looked for an indicator that remains close to the definition of industrialization as "mechanization of labor". The Registers of the Dutch Department for Steam Engineering are one of the few data sources (if not the only) that provide information on the mechanization of production at a regional level over a longer period. The registers provide an account of steam engines that were checked for safety and reliability, and cover the period up to 1890. It was not possible to calculate the actual volume of horsepower or number of steam engines in use in the municipality in a certain year, because the registers do not provide detailed information on the capacity of the machine nor on the period during which a steam engine was in use. We have therefore used the number of steam engines ever purchased in a given municipality. To account for the fact that in larger municipalities there was potentially more work that could be mechanized, we relate the number of steam engines ever purchased to the number of inhabitants in the municipality in the year of marriage.

Mass communication: Newspapers were the main mode of mass communication in the nineteenth century, providing not only regional and, later on, national news, but also information on developments in agricultural machinery for example (Priester, 1998, p. 240). Furthermore, newspapers provided an opportunity to place advertisements. Apart from the commercial advertisements placed by companies, there were also adverts for domestic servants and contact ads placed by individuals (Bras, 2002; Van Poppel & Ekamper, 2005). Unfortunately, due to the large number of different newspapers, it is not possible to count the number of newspapers distributed, nor, more importantly, to identify to whom they were distributed. However, the delivery of newspapers was directed through post offices. Furthermore, letters,

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telegrams, and fashion brochures through which people could learn of habits and fashion from regions other than their own were distributed through the post offices. In the absence of a more precise measure of mass communication we have therefore created a dichotomous variable, indicating whether or not a post office existed in the municipality and year of marriage.

Urbanization: Urbanization is measured by the size of the population of the municipality of marriage in the year of marriage. By combining the Historical Ecological Database, the Historical Database of Dutch Municipalities, and the Dutch Census, we were able to obtain information on municipal population size for every tenth year for the period 1811–1915. To be able to include information from the marriage records for those years for which data on urbanization was missing, we derived estimates through linear interpolation.

Geographical mobility: Geographical mobility is indicated by the proportion of in-migrants to a municipality relative to the population of that municipality in the year of marriage. Where no information on geographical mobility could be obtained from the databases, estimates of the number of in-migrants were derived in a manner analogous to that for urbanization.

Mass transport: Mass transport is taken to refer to mechanized transport such as cars, trains, and trams. Cars appeared in the Netherlands at the end of the nineteenth century, but archives report only national aggregates of the number of motor vehicles, while regional accounts cover only short time periods (Linders-Rooijendijk, 1989). Although there is a detailed account of Dutch railway stations, only four cities in the province of Zeeland had a railway station in the period under study (Sluiter, 2002). There was greater regional differentiation in the case of tram stations. Although in contemporary society trams are a means of transport within cities, in Zeeland in the nineteenth century trams were chiefly used to travel between cities. Lacking a detailed account of the frequency with which trams journeyed between cities, we created a dummy variable indicating the presence of a steam tram station or steam train station in a municipality in the year of marriage. The steam tram and steam train data are available for the entire period, but the first steam train station in Zeeland was not opened until 1868. Until 1915 no stations were closed in Zeeland.

Educational expansion: As a measure of educational expansion we use the number of students enrolled in secondary education in the municipality and year of marriage relative to the size of the population. In each municipality and for every five years, we recorded the number of students registered as full-time students for all types of secondary education, including gymnasia students.[3] For the years in between, we used the same estimation procedure as that employed for urbanization.

Several control variables will be included in the models. At the individual level these are:

Groom's age: Since occupational status tends to increase over the life course, we control for the age of the groom at marriage (mean centered). The data sources provide no information on the age of the groom's father or bride's father.

Groom is a migrant: This variable indicates whether the groom's municipality of birth is different from the municipality of marriage. It should be noted that this is only an approximation of migration, since the municipality of marriage may not always correspond with the place of residence at the time of marriage. Pélissier et al. show in a study of nineteenth- and twentieth-century France that migrants are more likely to marry a spouse from a different social background (Pélissier et al. 2005). Q8

Bride is a migrant: Similarly, we take into account whether the bride's municipality of birth is different from the municipality of marriage.

Groom's mother deceased: This is a dummy variable indicating whether the groom's mother was deceased before the marriage. This variable models differences in mate selection due to the loss of parents (and thus due to the loss of their influence; see Van Leeuwen & Maas, 2002, 2005). It is not possible to control for whether the groom's or bride's father was deceased, because for those fathers there is no information on occupational status.

Bride's mother deceased: This variable indicates whether the bride's mother was deceased before the marriage.

Groom was married before: This dummy variable indicates whether the groom married for a second or consecutive time. In the literature several arguments have been put forward claiming that people who remarry might look for characteristics in a future spouse which are different from those of their first spouse (Duberman, 1975; Jacobs & Furstenberg, 1986; Kalmijn, 1998). In their study of the Netherlands between 1850 and 1940, Van Leeuwen and Maas (2007) found that first marriages were more homogamous with regard to age and literacy.

[3] Although gymnasia students are recorded in the reviews of "higher education", we have included them because they were actually in secondary education preparing for higher education (Mandemakers, 1996).

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Table 1
Descriptive statistics of individual and contextual variables and group size.

Variable	Period	*N*	Mean	S.D.	Min	Max
Status of bride's father	1811–1915	38198	44.750	12.651	10.600	99.000
Status of groom's father (c)	1811–1915	38198	45.133	12.794	10.600	99.000
Status of groom (c)	1811–1915	38198	43.391	13.050	10.600	99.000
Groom's age (c)	1811–1915	38198	25.707	4.261	16.000	62.000
Groom's mother deceased	1811–1915	38198	0.305		0	1
Bride's mother deceased	1811–1915	38198	0.283		0	1
Groom is migrant	1811–1915	38198	0.505		0	1
Bride is migrant	1811–1915	38198	0.315		0	1
Groom was married before	1811–1915	38198	0.034		0	1
Bride was married before	1811–1915	38198	0.018		0	1
Industrialization: Steam engines (per 100 inhabitants)	1811–1890	6213	0.014	0.057	0.000	0.751
Mass communication: Post office	1811–1915	8791	0.107		0.000	1.000
Urbanization: Population (per 1000 inhabitants)	1811–1915	8791	1.800	2.327	0.103	21.973
Mass transport: Steam tram and/or railway station	1851–1915	8791	0.111		0	1
Time: Decade since 1800	1811–1915	8791	6.936	2.880	1.100	11.500
Geographical mobility: In-migrants (proportion)	1851–1915	6218	0.056	0.028	0.000	0.350
Educational expansion: Students (per 100 inhabitants)	1851–1915	6218	0.069	0.380	0.000	4.560
Religious composition: Protestants (proportion)	1851–1915	6218	0.778	0.331	0.000	1.000
Group size: Observations per group	1811–1915	8791	4.345	5.381	1.000	74.000

Note: *N* = Number of individuals in the case of individual characteristics, number of groups (municipalities × years) in the case of contextual characteristics. In the analyses, variables labelled (c) are centred around the mean of all available values of that variable.

Bride was married before: This is a dummy variable to indicate whether the bride married for a second or consecutive time.

Finally, at the contextual level we use religious composition and time as control variables for contextual processes that are not captured by our independent variables:

Religious composition: In the Netherlands between 1811 and 1915 there were about a dozen Protestant denominations. Almost everyone who was not affiliated to one of the various Protestant denominations belonged to the Catholic Church. Very few belonged to another denomination or were registered as not belonging to a Church. The main religious divide in the Netherlands was that between Protestants and Catholics. Our measure of religious composition is therefore the proportion of Protestants within a municipality and assumes that those who are not Protestant are Catholic.[4] In years for which no information was available on religious composition, it was estimated using linear interpolation.

Decade: This is a continuous indicator of time, with a value of zero in 1800 increasing by 0.1 every year after 1800.

[4] In a few cases the proportion of Protestants turned out to be somewhat larger than one, indicating some discrepancy within the census. In these instances the proportion of Protestants has been rounded down to 1.

An overview of the descriptive statistics of the variables is provided in Table 1.

3.4. Methods

To analyze the data we use hierarchical linear regression. This type of regression enables one to analyze clusters of data at the lower level(s). Furthermore, it allows the intercept and slopes to be variable across groups (Hox, 2002; Snijders & Bosker, 1999). In the analyses, individuals are nested in groups at a space × time level, meaning that a group is defined as all marriages in a municipality in a given year. In any given year the number of groups equals the number of municipalities where marriages occur, while the size of each group is determined by the number of marriages in a particular municipality in a given year. The group sizes thus vary between municipalities and over time. When group size varies and has a substantive meaning, it is advisable to control for group size (Snijders & Bosker, 1999). Since group size tends to be larger in larger municipalities, urbanization is used in each model as a control variable for group size.

The models consist of fixed effects and random effects for the intercept, the status of the groom and the status of the groom's father. A fixed effect represents the average across all groups (years and municipalities of marriage). It is referred to as "fixed", since, being an average, it is the same across all groups. In contrast to a fixed effect,

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a random effect is allowed to vary between groups:

$$Y_{ij} = \gamma_0 + \gamma_1 x_{1ij} + \gamma_2 x_{2ij} + \gamma_3 x_3 + \ldots + \gamma_k x_k + U_{0j} + U_{1j} x_{1ij} + U_{2j} x_{2ij} + R_{ij}$$

The first part of the model is the fixed part, the second part contains the random effects. Subscript i refers to an individual, whereas subscript j refers to a group: all individuals in a given municipality and year of marriage. For example, Y_{ij}, the dependent variable, is the status of a bride's father i in municipality and year of marriage j. γ_0 is the fixed part of the intercept. γ_1 is the fixed part of the effect of the status of a groom's father, x_{1ij}. γ_2 is the fixed part of the effect of a groom's status, x_{2ij}. γ_3 to γ_k are the fixed effects of x_3 to x_k, the other independent variables in the fixed part. These include variables at both levels and interaction effects. The random part of the model consists of the random intercept U_{0j}, and the random slopes U_{1j} and U_{2j} for the status of a groom's father and groom's status, respectively. R_{ij} is the residual at the individual level.

Since not all of the explanatory variables are available for 1811–1915, the analyses are divided over three time slots, represented in Tables 2–4. The models in Table 2 provide results for the entire period (1811–1915), but contain indicators only of macro processes that could be derived for this period. Table 3 provides a more in-depth look at the first part of the period, 1811–1890, by encompassing information on industrialization in the models. Table 4 applies to all macro processes discussed in this chapter, except industrialization, for the period 1851–1915. Each table contains a base model without contextual variables (except for urbanization) (Model 1), a "saturated" model with all available contextual characteristics (Model 2), and finally a "best fit" model (Model 3) based on the results of Model 2. In addition Table 2 contains an "empty" model (Model 0), to investigate how much of the variance in the occupational status of the bride's father is at the group level.

4. Results

4.1. Regional and temporal variation in achievement and ascription

Table 2 shows the effects of the occupational status of the groom's father and of the groom on the occupational status of the bride's father between 1811 and 1915.[5] Before we test our hypotheses, we consider our claims that (1) the status of the bride's father varies between groups, and that (2) there are group-specific effects of the groom's father and the groom on the bride's father. From Model 0 it follows that the variance in the status of the bride's father at the group level is 13.598 (with a standard error of 0.745) and that the proportion of group variance relative to total variance is 0.086 (13.598/(145.232 + 13.598)).

There was indeed similarity with respect to occupational status between different individuals from the same group (year and municipality of marriage), although differences within groups were much larger than differences between groups. The constant indicates that across all groups the "average" groom married a bride whose father had a status score of 44.257. However, the significant effect of the random intercept shows that the average status of brides' fathers differed substantially between groups. According to the model, in some of the groups the "average" father-in-law had a status score as low as 36.882 ($44.257 - 2\sqrt{13.598}$, two standard deviations below the mean) and in some groups as high as 51.632 (two standard deviations above the mean).

Our second claim, that the effects of the groom's father and of the groom differ between groups, is supported as well. Model 1 distinguishes a linear change over time in these effects from additional, mainly regional, variance. The negative interaction effect between the status of the groom's father and decade in Model 1 implies that the effect of the status of the groom's father decreased over time. There is no indication that the effect of the groom's status changed linearly. As a result, the effects of the status of the groom's father and groom became more equal. Whereas in the early nineteenth century the effect of the status of the groom's father is about 1.5 times as large as the effect of the groom's status (0.440/0.279), according to this model in the beginning of the twentieth century the effect of the groom's occupational status was even slightly larger than that of the groom's father (0.245/0.279).

Besides the change in the effect of the groom's father's status over time, there is residual variance between groups in both the effect of the groom's father and of the groom. Although at first sight the variances in the random slopes seem small, the 95 percent interval values shows clear differences between groups in the effect of the status of the groom's father and the groom on the status of the bride's father. For example, according to

[5] To improve readability, we describe the results for the associations between the occupational status of the bride's father, the groom's father, and the groom in terms of "effects". From a theoretical point of view it is more correct to refer to "associations" or "selection effects".

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Table 2
Hierarchical linear regression of occupational status of bride's father on individual and contextual characteristics, Zeeland, The Netherlands, 1811–1915 ($n = 38{,}198$).

	Model 0		Model 1		Model 2		Model 3	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Fixed effects								
Constant	44.257*	.080	46.835*	.228	46.893*	.239	46.873*	.229
Status groom's father			.440*	.019	.451*	.020	.461*	.019
Status groom			.279*	.020	.266*	.021	.267*	.020
Time			−.321*	.023	−.322*	.025	−.322*	.023
× status groom's father			−.017*	.002	−.013*	.003	−.015*	.002
× status groom			.001*	.002	.001	.003	.000	.002
Urbanization			.153*	.014	.105*	.020	.117*	.019
× status groom's father					−.001	.002		
× status groom					−.002	.002		
Mass communication					.426*	.195	.377*	.184
× status groom's father					−.086*	.020	−.108*	.014
× status groom					.083*	.021	.066*	.014
Mass transport					.035	.173		
× status groom's father					−.032	.018		
× status groom					−.012	.018		
Groom's age			.038*	.013	.040*	.013	.040*	.013
Groom is migrant			.789*	.106	.781*	.106	.791*	.106
Bride is migrant			−.769*	.114	−.787*	.114	−.779*	.114
Groom's mother deceased			−.453*	.120	−.452*	.120	−.454*	.120
Bride's mother deceased			.858*	.122	.857*	.122	.856*	.122
Groom was married before			−1.984*	.310	−2.003*	.310	−1.994*	.310
Bride was married before			.887*	.404	.891*	.403	.886*	.403
Random effects								
Level 2 random effects								
Intercept	13.598*	.745	2.067*	.365	2.052*	.347	2.054*	.348
Status groom's father			.038*	.003	.035*	.003	.036*	.003
Status groom			.040*	.004	.039*	.004	.039*	.004
Level 1 variance								
Intercept	145.232*	1.149	98.456*	.826	98.467*	.825	98.453*	.825
IGLS Deviance	301220.800	286566.700	286488.100	286500.100				

* Note: $p < 0.05$.

Model 1 in Table 2 in the upper 2.5 percent of the groups the effect of the status of the groom's father was almost twice as large (0.830) as the average effect of the status of the groom's father, while at the other extreme the effect was less than one-tenth of that (0.05). The 95 percent interval values for the groom's occupational status show that in some groups the effect of the groom's status was more than twice (0.679) the average effect, while in other groups the effect of the groom's status was actually negative (−0.121).

In the following subsections we discuss to what extent indicators of industrialization and other macro-level developments account for differences between municipalities and over time in the effects of the status of the groom's father and of the groom on the status of bride's father. This section ends with a brief discussion of the results with respect to the control variables.

With the exception of the models in Table 3 (1811–1890) all models show that older grooms had higher-status fathers-in-law. Grooms who married in a municipality different from that in which they were born married a bride from a higher-status family. In contrast, grooms marrying a bride in a municipality different from that in which she was born had lower-status fathers-in-law. If a groom married a bride whose mother was deceased he became related to a higher-status fathers-in-law. Grooms marrying for the first time had higher-status fathers-in-law than widowed grooms (or, far less likely, divorced grooms), while grooms marrying a "maiden" bride had on average lower-status fathers-in-law than

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Table 3
Hierarchical linear regression of occupational status of bride's father on individual and contextual characteristics, Zeeland, The Netherlands, 1811–1890 ($n = 20{,}551$).

	Model 1		Model 2		Model 3	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Fixed effects						
Constant	45.947*	.298	45.854*	.307	45.718*	.293
Status groom's father	.378*	.025	.391*	.026	.388*	.010
Status groom	.280*	.026	.285*	.028	.254*	.011
Time	−.220*	.038	−.196*	.040	−.178*	.037
× status groom's father	−.004	.004	.001	.004		
× status groom	.001	.004	−.004	.004		
Urbanization	.174	.021	.155*	.032	.174*	.032
× status groom's father			−.004	.003		
× status groom			−.005	.003		
Mass communication			.282	.288	.163	.285
× status groom's father			−.074*	.031	−.100*	.021
× status groom			.110*	.032	.081*	.022
Industrialization			−3.858*	1.497	−4.115*	1.484
× status groom's father			−.468*	.176	−.472*	.165
× status groom			.520*	.180	.462*	.170
Groom's age	−.024	.017	−.023	.017	−.024	.017
Groom is migrant	.877*	.142	.879*	.142	.879*	.142
Bride is migrant	−.846*	.150	−.840*	.150	−.836*	.150
Groom's mother deceased	−.287	.153	−.295	.152	−.288	.152
Bride's mother deceased	.933*	.154	.929*	.154	.928*	.154
Groom was married before	−1.400*	.364	−1.404*	.363	−1.389*	.363
Bride was married before	.953*	.461	.948*	.460	.964*	.460
Random effects						
Level 2 random effects						
Intercept	2.188*	.540	2.121*	.536	2.155*	.537
Status groom's father	.046*	.005	.043*	.005	.043*	.005
Status groom	.055*	.006	.053*	.006	.053*	.006
Level 1 variance						
Intercept	94.010*	1.125	94.063*	1.123	93.983*	1.123
IGLS Deviance	153581.900	153516.200	153525.300			

* Note: $p < 0.05$.

grooms marrying a widowed (or divorced) bride. Finally, Table 4 (1851–1915) shows that the influence of the occupational status of the groom's father on the status of the bride's father was larger in regions more Protestant than in regions more Catholic.

4.2. Mate selection and macro-level developments

The extent of industrialization is indicated by the number of steam engines per 100 inhabitants of a municipality in a certain year. Models 2 and 3 in Table 3 (1811–1890) clearly show that the effect of the occupational status of the groom's father on the status of the bride's father decreased, while the effect of the groom's status increased with industrialization. The predicted differences in the effects are substantial. For example, the effect of the status of the groom's father on the bride's father in municipalities where there was one steam engine for every 250 inhabitants was almost half that of the figure for municipalities without steam engines $((.388 - .472 \times 0.4)/.388 = 0.513)$. Although this is a relatively high ratio of steam engines, from 1872 onwards there were five municipalities (Breskens, Hulst, Kerkwerve, Nieuwerkerk, and Sas van Gent) which had at least one steam engine for every 250 inhabitants. In those municipalities the effect of the groom's occupational status on the status of the bride's father was 1.7 times as large as that in municipalities with no steam engines $((.254 + .462 \times 0.4)/.254)$. The effects of the occupational status of the groom's father and of the groom

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Table 4
Hierarchical linear regression of occupational status of bride's father on individual and contextual characteristics, Zeeland, The Netherlands, 1851–1915 ($n = 31{,}736$).

	Model 1		Model 2		Model 3	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Fixed effects						
Constant	48.212*	.356	47.696*	.444	47.673*	.414
Status groom's father	.597*	.035	.546*	.045	.582*	.042
Status groom	.239*	.036	.196*	.046	.210*	.042
Time	−.452*	.037	−.445*	.040	−.439*	.037
× status groom's father	−.033*	.004	−.031*	.004	−.033*	.004
× status groom	.006	.004	.006	.004	.007	.004
Urbanization	.150*	.015	.098*	.022	.110*	.021
× status groom's father			−.002	.002		
× status groom			−.001	.002		
Mass communication			.443*	.212	.470*	.202
× status groom's father			−.102*	.022	−.120*	.018
× status groom			.086*	.022	.081*	.018
Mass transport			.171	.181		
× status groom's father			−.032	.019		
× status groom			−.006	.019		
Educational expansion			−.036	.139	−.049	.138
× status groom's father			.023	.014	.015	.012
× status groom			−.027*	.013	−.030*	.012
Geographical mobility			2.129	2.598		
× status groom's father			.475	.268		
× status groom			.352	.274		
Religious composition			.583*	.224	.591*	.224
× status groom's father			.055*	.025	.051*	.025
× status groom			.002	.024	.001	.024
Groom's age	.055*	.015	.062*	.015	.062*	.015
Groom is migrant	.724*	.116	.724*	.118	.722*	.116
Bride is migrant	−.735*	.126	−.745*	.127	−.745*	.126
Groom's mother deceased	−.446*	.134	−.433*	.134	−.433*	.134
Bride's mother deceased	.667*	.137	.677*	.137	.675*	.137
Groom was married before	−1.948*	.362	−1.995*	.362	−1.988*	.362
Bride was married before	.772	.478	.753	.478	.761	.478
Random effects						
Level 2 random effects						
Intercept	1.840*	.360	1.786*	.357	1.802*	.358
Status groom's father	.034*	.004	.031*	.004	.032*	.004
Status groom	.034*	.004	.032*	.003	.032*	.004
Level 1 variance						
Intercept	99.345*	.901	99.360*	.900	99.351*	.900
IGLS Deviance	238101.000	238004.600	238023.000			

* Note: $p < 0.05$.

were equally large at an industrialization ratio of 0.135, i.e. one steam engine for every 740 inhabitants. About one-sixth of all municipalities in Zeeland reached this level of industrialization before 1890. In Middelburg and Vlissingen (Flushing), Zeeland's largest cities by far, with the largest number of steam engines ever purchased, the ratio of steam engines to inhabitants never rose above 1:2000 and 1:2500, respectively.

More pervasive mass communication decreased the effect of the status of the groom's father on the status of the bride's father, while it increased the effect of the groom's occupational status between 1811 and

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Table 5
Correlation matrix of contextual variables ($N = 3640$).

	Industrialization	Mass communication	Urbanization	Geographical mobility	Mass transport	Educational expansion	Religious composition	Time
Industrialization	1.000							
Mass communication	0.235	1.000						
Urbanization	0.124	0.636	1.000					
Geographical mobility	0.080	0.031	−0.052	1.000				
Mass transport	0.190	0.304	0.303	0.090	1.000			
Educational expansion	0.130	0.490	0.576	0.020	0.333	1.000		
Religious composition	0.040	−0.090	−0.061	0.083	0.008	0.023	1.000	
Time	0.250	0.013	0.046	0.231	0.275	0.116	−0.034	1.000

1915 (models 2 and 3 in Tables 2–4). In municipalities with a post office the effect of the groom's father was about 20 percent smaller than in municipalities that lacked this facility, while the effect of the groom's status was about 35 percent larger. While the smaller influence of the groom's father supports our hypothesis, the larger influence of the groom's occupational status does not.

In models without other indicators for macro-level developments (not shown), urbanization affects the influence of the occupational status of the groom's father and the groom in the same way as mass communication: it decreases the influence of the status of the groom's father on the status of the bride's father, while it increases the influence of the groom's occupational status. There are, however, moderate to large correlations between urbanization on the one hand and mass communication, mass transport, and educational expansion on the other (Table 5). Once controlled for these other macro characteristics, population size does not affect the effects of the status of the groom's father and of the status of the groom. These findings are consistent in all three tables. Although urbanization is hypothesized to directly influence the associations between the status of the groom's father, groom, and bride's father, it appears that the influence of urbanization is a derivative of other macro-level developments.

Data on geographical mobility measured as the ratio of in-migrants relative to the population are available only for the period 1851–1915 (Table 4, Model 2). Neither the interaction effect with the status of the groom's father nor that with the status of the groom is significant. The expected negative influence of regional mobility on the effect of the status of the groom's father and of the groom is not observed.

The availability of mass transport, indicated by the presence of a railway station or steam tram station, did not affect the influence of the occupational status of the groom's father on that of the bride's father. Although the effect is in the hypothesized direction, it is not significant. Furthermore, the results do not support a decreasing influence of the groom's occupational status due to mass transport (Tables 2 and 4).[6]

The sixth and final macro-level process we consider in this chapter is that of educational expansion (models 2 and 3 in Table 4). An increase in the number of students relative to the population does not decrease the effect of the occupational status of the groom's father on the status of the bride's father. This is contrary to our hypothesis. However, the decreasing effect of the groom's occupational status on the status of the bride's father is consistent with this theory. Substantially, this decrease is not very important. One standard deviation difference in the number of students in secondary education leads to a difference in the effect of the occupational status of the groom of .011 (.380 × .030) (Table 4).

5. Conclusion and discussion

In this study we have shown that the process of mate selection, and more precisely the importance of ascribed and achieved characteristics for marrying a woman with a high status, varied considerably over time and between regions in the long century in which the Dutch province of Zeeland industrialized. In general, grooms who either had a high occupational status themselves or came from a high-status family married higher-status brides. In some municipalities and in some years, however, the effects were much stronger than in other places and periods. Only in the case of the influence of the father could this variation partially be expressed as a linear decrease over time.

The first question to be addressed is whether this decrease might have resulted from the fact that not all

[6] Mass transport is not included in the models for the period 1811–1890 because before 1890 very few municipalities had either a train or a tram station.

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marriages could be included in the analyses. As discussed before, if either the father or the father-in-law had died before the marriage of their child, their occupational status would not have been recorded. Those marriages had to be excluded. It has been claimed that, especially at the beginning of the period of our study, death was common and not random. Higher-status fathers were more likely to survive until their children's marriage, while later in the nineteenth and twentieth centuries the association between status and survival became weaker. However, two recent studies, as well as our own results, indicate that in the Netherlands in the nineteenth and early twentieth centuries mortality rates were not related to social status. Nevertheless, the death of the father could have had (at least) two effects on mate selection. First, it is likely that the children of deceased fathers were at a disadvantage. They would marry lower-status partners than would be predicted on the basis of their own and their deceased father's status. This main effect of death should not bias our results, since it applies to the fathers of both brides and grooms. The exclusion of grooms with a deceased father made the regression line of the effect of the father's status on the father-in-law's status less steep; however, the exclusion of brides with a deceased father compensated for this bias.

Secondly, the death of a father could cause the influence of the status of the father to become weaker and the influence of the groom's own status to become stronger. Because the likelihood of an early death was greater at the beginning of the nineteenth century than during the twentieth century, this would lead to biased results. Leaving out grooms for whom the mate selection process was hardly affected by their father's status and strongly affected by their own status would lead to an overestimate of the effect of the father's status and an underestimate of the effect of the groom's status. The linear decrease over time in the importance of the father's status might thus have been caused by the decrease in early deaths among the fathers. However, the fact that there is no evidence of an increase in the importance of the groom's status over time is not consistent with this explanation. Furthermore, even if the complete change over time in the parental effect is due to the selection of deceased fathers, this still does not much affect our conclusions. All models include both interactions of ascribed and achieved characteristics with time and interactions with indicators of industrialization and accompanying macro-level processes. It is very unlikely that the survival rate of men was directly related to regional variations in industrialization, mass communication, or any other macro-level process. We will therefore assume that, even if the linear trend was caused by selection, conclusions about the effects of the indicators of industrialization and the accompanying macro-level processes are sound.

We tested a series of hypotheses to explain the variation in the importance of the father's and groom's status for mate selection. The hypothesis that has been central in the literature on this topic is the industrialism thesis, according to which industrialization caused ascribed characteristics to become less important and achieved characteristics to become more important for partner choice. For the first time, this hypothesis has been tested on a large-scale dataset, with reference to the period before and during industrialization and with explicit measurement of regional and temporal variations in industrialization. The findings support the industrialism thesis. With increasing industrialization (1) the association between the occupational status of the groom's and the bride's father decreased, while (2) the association between the status of the groom and that of the bride's father increased. The latter association is a combination of selection on achieved characteristics (status of the groom) and ascribed characteristics (status of the bride's father). The actual increase in the importance of achieved characteristics was, thus, probably stronger than the change in this association shows.

Macro-level processes other than industrialization were hypothesized to make both ascribed and achieved characteristics less important for mate selection because of a decline in the orientation towards one's own group. Mass communication, urbanization, regional mobility, the development of mass transport, and educational expansion would promote the development of a common culture and decrease regional, ethnic, and class differences in attitudes and behavior. These hypotheses do not find much support. Only the development of mass communication led to a decrease in the effect of the father's status, whereas educational expansion decreased the effect of the status of the groom. Opposing effects are found just as often. With the development of mass communication the effect of the groom's status became more important, while the rise of mass transport and urbanization and increasing regional mobility do not seem to be related to processes of mate selection. One possible explanation for these mixed findings is that mass transport and communication not only enhanced the opportunities to meet dissimilar others but also provided new opportunities to meet and interact with similar others. Besides, the sheer presence of means of mass transport does not mean that the whole population, or even large parts of the population, used these means to the same degree. If only a small part of the population, probably the elite, took advantage of the new possibili-

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ties, the effect on marriage behavior may be too small to observe.

Taken together, our results show that the Dutch marriage market did not open up during industrialization. Processes accompanying industrialization did not '*break down* the rigidity of the class structure of traditional society' as Treiman suggested (Treiman, 1970, p. 210, italics are ours). Although it has often been argued that contact with dissimilar others decreases prejudice and increases mutual understanding, we do not find support for such mechanisms in the Dutch society during the 19th century. Although tremendous changes took place in the possibilities to get to know people from other status groups, this did not lead to a general decrease in the importance of status while selecting a spouse.

However, at the same time, we do observe a shift from ascription to achievement in the marriage market. In line with the industrialism thesis women select their spouse increasingly on the basis of his own achievement instead of the status of his father. This is generally interpreted as 'more fair' than assortative mating on the basis of ascription. However, since husband's status also replaces father's status as best predictor of a couple's resources, economic inequality between households did probably not diminish.

Q9 Uncited references

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